

by Linda Milo Ohr

Fats for Fitness

Research has shown that fatty acids and nutritional oils may benefit cognition, weight management, heart health, eye and brain development, and even mood. As a result, they have jumped into the limelight for these potential benefits, making the inclusion of fats in the diet more appealing. Here is a look at some of these functional fats.

Omega-3 Fatty Acids

Omega-3 fatty acids, particularly eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), are associated with brain development, cognition, eye health, dementia, and depression. They are widely known for their heart health benefits. Researchers de Oliveira Otto et al. (2013) showed that EPA and DHA from seafood were inversely associated with cardiovascular disease incidence, suggesting that increased consumption may help prevent risk development in a multiethnic population.

North America has the largest number of dairy launches using omega-3 claims, with nearly 35% of the global total, according to Innova Market Insights, Duiven, the Netherlands (www.innovadatabase.com) (Innova, 2014). In the United States there is rising interest in omega-3-fortified milk, with Innova's data indicating that nearly 8% of milk launches in the U.S. in the 12 months ending October 2013 featured omega-3 claims.

In addition to dairy, there is plenty of room for innovation using omega-3s in products for consumers of all ages. This is in part thanks to the advancements in omega-3 ingredient developments. At the 2014 IFT Food Expo, BASF Nutrition & Health, Florham Park, N.J. (www.newtrition.basf.com), showcased a graham cracker and a chocolate almond butter spread that were both formulated with omega-3 fatty acids. "These were among our most popular prototypes and, in fact, one attendee called them 'IFT gold,'" says Elsie Jamin-Maguire, Business Manager, Foods & Beverages, at BASF Nutrition & Health.

BASF Nutrition & Health offers *Omevital™ 1812 TG Gold* (fish oil, minimum 30% omega-3); *Omevital 1050 TG Gold* (fish oil concentrate, minimum 61% omega-3 as TG, DHA rich); *Dry n-3® 12 Food* (microencapsulated fish oil rich in omega-3); and *Dry n-3 DHA 11* (microencapsulated fish oil rich in DHA). *Omevital TG Gold* oils are specially deodorized for food and beverage applications. The *Dry n-3* microencapsulated EPA- and DHA-rich ingredients are produced in Denmark using a microencapsulation technology, which results in an ingredient with excellent flowability and high stability.

DSM, Parsippany, N.J. (www.dsm.com/human-nutrition), in 2013 launched *life'sOMEGA™ 60*, a high-potency vegetarian DHA



Nut butter spreads are applications that have potential for fortification with omega-3 fatty acids. Photo courtesy of BASF Nutrition & Health

and EPA omega-3 oil developed from a sustainable algal source. The ingredient is said to provide all the benefits of *life'sDHA™* with additional EPA, resulting in an ingredient that is a higher-potency, more sustainable alternative to fish and krill oils. DSM's portfolio also includes *life'sDHA* and *MEG-3®* fish oil. *MEG-3* is sourced from wild-caught, sustainable fisheries that adhere to the strict regulations of government agencies in the Peruvian upwelling region.

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In June 2014, Enzymotec Ltd., Migdal HaEmeq, Israel (www.enzymotec.com), launched *Omega PC™* fish oil-based omega-3 ingredient, a wild, cold fish extract containing omega-3 fatty acids bound to phospholipids and triglycerides. The omega-3 fatty acids bound to phospholipids have been shown to be absorbed better than triglyceride-bound omega-3 fatty acids. The better absorption leads to better efficacy and to higher accumulation of omega-3 fatty acids in target organs. >>>

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Pinolenic Acid

Stepan Lipid Nutrition, Maywood, N.J. (www.ste-pan.com), produces *PinnoThin*[®], which is based on pine nut oil derived from a specific Korean pine tree. The oil is especially rich in long-chain fatty acids such as pinolenic acid.

PinnoThin functions as a weight management

ingredient for its satiety effects. Clinical trials have shown that it can help suppress appetite and promote a feeling of fullness. According to the company, one study showed that within 30–60 minutes after taking a dose of *PinnoThin*, the release of the satiety hormone cholecystokinin was significantly increased in the blood of the test subjects compared to those who had taken the placebo. The natural metabolites of *PinnoThin* also significantly increased the release of another satiety hormone, glucagon-like peptide 1, in the blood.

Conjugated Linoleic Acid

Conjugated linoleic acid (CLA) has been shown to affect weight management by helping to reduce body fat and increase lean body mass.

BASF Nutrition & Health offers *Tonalin*[®] CLA (www.tonalin.com, <http://tonalin.com/success.htm>), naturally derived from safflowers. “Reaching fitness goals is more than a trend,” remarks Jamin-Maguire. “From younger professionals to Baby Boomers, consumers want products to improve or maintain their body composition. *Tonalin* helps reduce body fat and build and maintain lean muscle mass.

“It’s ideally suited for pre- and post-workout beverages. Young professionals are more likely than other generations to consume milk before or after exercise, making the demographic a great

Milk formulated with conjugated linoleic acid may help reduce body fat and maintain muscle mass when consumed as a pre- and post-workout beverage. Photo courtesy of BASF Nutrition & Health



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Remoulade can get a boost of omega-3s from a new oil blend ingredient.
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target for health-focused milk products," continues Jamin-Maguire.

More than 20 clinical studies support *Tonalin's* effectiveness in reducing body fat. Thom et al. (2001) showed that CLA reduced body fat in healthy subjects of normal body weight who exercised. Gaullier et al. (2004) showed that long-term supplementation with CLA in free fatty acid form or CLA-triacylglycerol reduced body fat mass in healthy overweight adult subjects, and Gaullier et al. (2005) showed that CLA supplementation for 24 months decreased body fat mass in overweight adult subjects.

Clarinol® from Stepan Lipid Nutrition is a patent-protected CLA ingredient derived from safflower. Studies have shown that *Clarinol* not only helped reduce body fat, but it did so in specific areas of the body where fat loss is most desired without extra dieting or exercise efforts.

According to the company, the results of a six-month clinical trial showed that the reduction in fat mass primarily occurred in the places that improve overall body shape and health the most: the abdomen and, particularly in women, the legs.

Flaxseed Oil

Flaxseed oil is a good source of omega-3 fatty acids as well as omega-6 and omega-9 essential fatty acids. Flaxseed oil provides approximately 50–60% omega-3 fatty acids in the form of alpha-linolenic acid. Flaxseed oil has been used by consumers for its reported benefits in heart health and inflammation.

Hemp Oil

Hemp seed oil contains a balanced 3:1 ratio of omega-6 (linoleic to omega-3 alpha-linolenic) essential fatty acids. In addition, it also contains less gamma-linolenic acid, oleic acid, and stearidonic acid. Hemp seed oil also contains vitamin E.

Fish Oil

Nutegrity, Irvine, Calif. (www.nutegrity.com), offers *OmegaPure*® fish oil, which is high in docosapentaenoic acid (DPA). "DPA is the exciting 'new' omega-3 fatty acid," says April Lewton, Category Director—Lipids at Nutegrity. "DPA has always been 'around' but research is increasingly recognizing its significance on human health." DPA is structurally similar to DHA with 1 less double bond. While not as much scientific work has been done on DPA as on EPA and DHA, it looks like DPA may play a significant additional role when it comes to cardiovascular, neurological, and cognitive health, explains Lewton. For example, she points to the Nurses' Health Study at Harvard, one of the largest and longest investigations ever conducted, which showed that higher plasma concentrations of DPA were predictive of cardiovascular health. A large, separate epidemiological trial showed that dietary intake of DPA was related to elasticity of the arteries in adults. Nutegrity is vertically integrated, and its *OmegaPure* fish oil is made entirely in the U.S.

Cargill Inc., Minneapolis, Minn., (www.cargill.com, www.cargillfoods.com/ingrevita), launched *IngreVita*™, an omega-3 oil blend, during the 2014 IFT Food Expo and showcased it in a remoulade prototype. It is a low-cost and easy-to-use ingredient that can help food manufacturers boost the nutritional

benefits of their products. *IngreVita*, a blend of high oleic canola oil, fish oil, and proprietary antioxidants, delivers EPA and DHA. Because handling of the product is similar to canola oil, it is easy to use. It offers good shelf stability and does not introduce off-flavors.

Canola Oil

Jenkins et al. (2014) showed that a canola oil-enriched, low-glycemic-load diet improved glycemic control in type 2 diabetics, particularly in participants with raised systolic blood pressure. The research was presented at the June 2014 American Diabetes Association Scientific Sessions (CanolaInfo, 2014). In the randomized controlled trial, 141 subjects with type 2 diabetes who were taking drugs to control blood glucose were given either an experimental or control diet for three months. The experimental diet was low glycemic index and higher in fat, including bread made with canola oil (31 g of oil per person per day). The control diet was healthy, low-fat, and high-fiber, emphasizing whole wheat foods. The results showed that those who consumed the diet higher in canola oil improved blood glucose control.

Soybean Oil

Commercialized in 2011, high oleic soybean oils are ideal for reformulating foods to be healthier without compromising taste. These oils have reduced saturated fat and 0 g of *trans* fat, and deliver three times the amount of monounsaturated fats compared to commodity soybean oil. The United Soybean Board (USB), Seattle, Wash. (www.soyconnection.com), and *QUALISOY*®, Seattle, Wash. (www.qualisoy.com), announced a commitment to the success of high oleic soybean oils for the food industry. USB pledged \$60 million over the next five years to quickly expand seed production of high oleic soybean varieties across a wide geography and to market high oleic soybean oils to food companies and other stakeholders. As a result, they project that 9 billion pounds of high oleic soybean oil will be available by 2023 to meet global demand.

Coconut Oil

Coconut oil is popular among consumers

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today. Although research on coconut oil is not as prevalent as research on other oils such as olive and fish oil, coconut oil is thought to aid in areas such as energy, skin health, and dental health. It is rich in medium-chain triglycerides (MCTs) and lauric acid, which are both thought to contribute to its reported benefits.

Cognate Nutritionals Inc., Bloomfield, Conn. (www.fuelforthought.co), offers *Fuel For Thought*, an extra-virgin coconut oil beverage fortified with MCTs. It is currently being used in a clinical trial assessing the benefits of coconut oil in subjects with mild-to-moderate Alzheimer's disease at the Byrd Alzheimer's Institute in Tampa, Fla. The trial began in 2013. *Fuel For Thought* has been shown to raise ketone levels significantly enough to enhance brain function, including memory, clarity, and cognition. Each 1.25-oz serving of *Fuel For Thought* delivers 2.5 times the benefits of three tablespoons of pure coconut oil. **FT**



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